

THE EFFECTIVE TEACHING OF THE RELATED SCIENCES IN THE
ANIMAL PRODUCTION COURSE IN VOCATIONAL AGRICULTURE

by

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INTRODUCTION

The purpose of this study was to determine the most commonly taught scientific facts in the sciences related to the animal production course in vocational agriculture, and the most common teaching methods used in presenting those facts.

No type plan for teaching scientific facts has been devised for use in instruction in vocational agriculture in Kansas. It is evident that certain phases of those sciences related to any production job in vocational agriculture that are necessary, must be taught in some such way, so as to give comprehensive understanding. What science to teach and method to use has been controversial and no common agreement has been arrived at to the present.

Usable textbooks and reference materials for sciences related to the animal production course are few. Most books dealing with related science facts have not been written with the idea in mind that they should serve as a ready source of reference to the field of practical agriculture as taught in vocational. On the contrary they are in most cases prepared for the pure science or related science course in high school. Therefore, the bibliography for this study will be meager.

ACKNOWLEDGEMENTS

Acknowledgements are hereby made for the valuable counsel and assistance rendered by Professor A. P. Davidson, Associate Professor of Vocational Education, who acted as major instructor to the writer; to Dr. C. V. Williams, Professor of Vocational Education at the Kansas State Agricultural College; to Professor E. H. King, head of the department of Chemistry; to Professor L. D. Bushnell, head of the department of Bacteriology; to Professor E. H. Haymaker, Professor of Botany; to Professor George Dean, head of the department of Entomology; to Dr. Minna E. Jewell, Assistant Professor of Zoology; to Dr. H. L. Ibsen, Professor of Genetics; and to Professor E. V. Floyd, Professor of Physics, of the Kansas State Agricultural College, who gave the writer much valuable assistance.

DEVELOPMENT OF THE PROBLEM

That agriculture is based upon fundamental scientific facts has been long established. Productive practices in agriculture are determined by underlying scientific principles. These scientific facts must be brought clearly into the foreground.

The objectives of this study have been to determine, if

possible, what scientific facts are necessary, and how to best present them, so as to give a clear understanding of the jobs undertaken by the class in animal production.

Vocational agriculture established in the United States under the Smith-Hughes Act and accepted by all states, was primarily intended for instruction in productive agriculture. Nothing in the Federal Act definitely stated concerning the teaching of related sciences. Most state plans vary greatly on this point. According to Williams (1925), page 16, the following provisions are typical of most state plans: (1) Science required as a separate course, (2) Science taught as part of course, (3) Science courses urged as electives.

The farm boy is generally offered the opportunity to enroll in vocational agriculture in any of the four years of high school, depending somewhat on the state plan and the character of the course of study of the local school. He may select this course upon entering high school as a freshman or defer the course until later years of his high school work. If he selects vocational agriculture as a freshman he has had no instruction in any related science course. The greatest number of farm boys in Kansas high schools enroll in vocational agriculture as freshmen and sophomores. Therefore, we find great numbers of farm boys

enrolled in animal production classes each fall who have no instruction in the basic sciences. A second group of vocational agriculture boys may be found in these same classes. This group consists of boys who have had one or more high school science courses. These boys for the most part are sophomores and juniors with possibly a few seniors.

If it were possible that all boys who enroll in animal production had as prerequisites certain high school science courses, we must still consider another factor. Does he have functional knowledge of all the necessary sciences related to the animal production course? Few schools offer chemistry until the junior year, and still fewer schools offer courses in entomology, zoology and bacteriology. Most of our Vocational Agriculture departments are found in the rural high school. These high schools are very limited in their science offerings.

What sciences are sufficiently related to the animal production course? In setting up the field of related science investigation, the writer has drawn somewhat upon his six years of experience in teaching vocational agriculture. Additional help and information was obtained from the science departments of the Kansas State Agricultural College. The following sciences were selected as being important and related to the animal production course:

Bacteriology	Genetics
Botany	Physics
Chemistry	Zoology
Entomology	

The relative value of each science to the animal production course was discussed with the head of the respective science department, or a member of the department at the Kansas State Agricultural College. All sciences first selected were permitted to remain on the list and none others were added.

Proceeding on the assumption that the above seven sciences were important and related to animal production, each head of the respective science departments or members thereof was again interviewed, in regard to the more important scientific facts to be included in such a course. Each member interviewed made careful study of the list of scientific facts set up by the writer. Much valuable assistance was given by each member interviewed. Some facts first listed were omitted, others added and often several combined into one statement. It was constantly kept in mind that the scientific facts set up under each science should be those most necessary for the vocational agriculture class, to become informed upon in order to give a clear understanding of practical production work.

The essential problems considered in this study were: (1) What are the facts to be taught under each science selected? (2) By what method or methods are these facts commonly presented to the class? As a means of securing the above information the following questionnaire was formulated and used in the study: (It will be noted that on the first page of the questionnaire proper, included in this thesis as page 9, under "How Taught", seven methods are included. In the original questionnaire these seven columns were, of course, included on each page. In this thesis, however, in the interest of brevity, these seven columns appear, as stated above, only on the first page of the questionnaire proper.)

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THE EFFECTIVE TEACHING OF THE RELATED SCIENCES IN LIVESTOCK PRODUCTION IN VOCATIONAL AGRICULTURE COURSES

In the interest of uniformity of replies, it is hoped you will accept the following definitions of teaching methods in answering this questionnaire. It is assumed that the methods herein listed below are standard teaching devices.

If a method used in your instruction differs slightly from the definition set up, list it under the method which it most nearly approaches. In case the method does not fall under those listed, place in column marked "Others". We will greatly appreciate all such explained in detail on additional sheet of paper.

Use the numerals 1, 2, 3, in the column of methods to show the rated value of each method in teaching a particu-

lar specific fact. You are expected to give only the scientific facts that you teach in your vocational program.

FOR EXAMPLE:

WE TEACH THE FOLLOWING
SCIENTIFIC FACTS OF ENTO-
MOLOGY IN LIVESTOCK PRO-
DUCTION IN VOCATIONAL
AGRICULTURE

	LECTURE	ILLUSTRATION	LABORATORY EXERCISE	DEMONSTRATION	FARM PRACTICE	ASSIGNED READING AND RECITATION	FIELD STUDY	SUPERVISED STUDY AND RECITATION	OTHERS
1. How insects are controlled by remedial methods.....				3	1		2		
2. The Life Cycle of Insects.....			2				1	3	

In the above table you will note that Farm Practice is the most important procedure in teaching the "How Insects are controlled by Remedial Methods". Field Study is rated as of second importance; and Demonstration as third in importance.

In teaching "The Life Cycle of Insects", Field Study is the most valuable method, Laboratory Exercise the second, and Supervised Study and Recitation the third in order of value.

Make your selection of a teaching device on the basis of your experience and your judgment. Do not offer more than three teaching methods for any one scientific fact.

The following definitions of teaching devices or methods are offered:

LECTURE: The instructor tells the students in simple understandable terms the facts, operations, laws, etc., concerning a scientific problem and shows its connection with what is to follow. He may use some charts or pictures or other illustrative material to help, but the main source of information is what he tells.

ILLUSTRATION: This is teaching by the aid of charts, maps, pictures, slides, films, microscopic specimens, and biological specimens, and is supplemented by a very limited amount of telling. The boys may have read considerable about the matter up for discussion and now are merely satisfying themselves and further impressing the facts and information through the faculty of Vision.

LABORATORY EXERCISE: This method involves the setting up and performing of a specified scientific exercise on the part of the students under the direction of the teacher. They may follow oral or written instructions as to procedure.

DEMONSTRATION: In this method the work is done by the teacher, a student, or a group of students before the class. The principle involved and facts revealed are explained by the person or group responsible for the demonstration.

FARM PRACTICE: By this method the teacher takes the class to the farm and performs a practice that will teach a scientific fact. For example: In Controlling Leaf eating insects, the teacher might take the class to a farm orchard, apply the poison according to best methods for the control of that specific insect. All scientific information would be studied, discussed, and explained and the boys would learn this scientific fact through actual practice.

ASSIGNED READING AND RECITATION: The student learns the scientific facts by reading references selected by the teacher and assigned to the class. The class is held for subject matter in the recitation.

FIELD STUDY: This method, preceded by supervised study and recitation takes the class to the fields, the stock pens, or any other place on the farm or in the community suitable for the study. The scientific facts or principles involved are taught in their natural setting.

SUPERVISED STUDY AND RECITATION: Assignments are made. The study supervised. The recitation and discussion bring out important points and clear up doubtful facts.

OTHERS: Under this column indicate such methods of procedure as will not readily lend themselves to classification under the methods listed. Always accompany each method by written explanation.

[illegible]

QUESTIONS

1. Materials from which plant foods are made.....
2. How plants secure these materials.....
3. Sources of the materials from which plant foods are made
4. How plants use these materials.....
5. What are carbohydrates and where are they found in plants.....
6. The relative importance of the different kinds of carbohydrates found in plants.....
7. How are carbohydrates important to livestock.....
8. What fats and oils are, where they are found in plants, and their value to livestock.....
9. What proteins are and where they are found in plants.....
10. The kinds of proteins found in plants that are important to livestock.....
11. How proteins are important to livestock.....
12. How plants acquire mineral life.....
13. Relative value of different qualities of plants for specific mineral needs.....
14. The most important element in each type of food and how it is important to animal nutrition.....
15. The mineral value of plants as related to livestock nutrition.....
16. Names of a group of plants important to livestock.....

EXERCISES

1. Research material.....
2. Minerals and what they will.....
3. Carbohydrates and what they will.....

2. The chemical basis for reproduction.....
3. The chemical basis for inheritance.....
4. The composition of cells.....
5. The composition of tissues.....
6. Cells, tissues, organs and their relation to life.....
7. The chemical composition of the plant body.....
8. Chemical composition of the animal body.....
9. The chemical changes that take place in the animal body during digestion.....
10. The principal elements found in the body, proteins, carbohydrates, fats.....
11. The importance of each function in body of the organism.....
12. How vitamins are, their value, where found.....
13. How the body uses proteins.....
14. How the body uses carbohydrates.....
15. How the body uses the vitamins.....
16. Chemical composition of animal tissues.....

EXERCISES

1. The relative importance of tissues and their relation to life.....
2. The chemical composition of tissues.....
3. The chemical composition of cells.....
4. The chemical changes that take place in the animal body during digestion.....
5. The principal elements found in the body, proteins, carbohydrates, fats.....
6. The importance of each function in body of the organism.....
7. How vitamins are, their value, where found.....
8. How the body uses proteins.....
9. How the body uses carbohydrates.....
10. How the body uses the vitamins.....
11. Chemical composition of animal tissues.....

- 1. The different types of reproduction found among animals
- 2. Conditions governing the reproduction among animals...
- 3. The role of food factors in reproduction...
- 4. The life cycle of an animal...
- 5. Types of development of animals and their main types...
- 6. Animals affecting animal products...
- 7. The various methods of breeding...
- 8. The history and present status of the specific breeding...

CHAPTER

- 1. Animal selection...
- 2. On origin and of natural selection...
- 3. The natural and artificial selection theory...
- 4. The evolution law of Darwinism...
- 5. The inheritance theory...
- 6. That characters are not stable part in heredity...
- 7. That a genetic theory...
- 8. That a genetic theory...
- 9. Darwin's theory...
- 10. Mendel's theory...
- 11. That a biogenetic individual...
- 12. That a biogenetic individual...
- 13. The theory of transformation...
- 14. That a pure line theory...
- 15. The heredity theory...

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22. The 14th-century manuscript.....
25. The 15th-century manuscript.....
28. The 16th-century manuscript.....
31. The 17th-century manuscript.....
34. The 18th-century manuscript.....

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4. The 4th-century manuscript.....
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99. The 99th-century manuscript.....
100. The 100th-century manuscript.....

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- 26. The principles of the cross experiment.....
- 27. The general principles of learning.....
- 28. The principles involved in all performance.....
- 29. The general principles involved in motivation and
production of actual performance.....
- 30. The general principles involved in the all system.....

COOLING

- 1. The major effects of heat loss.....
- 2. The effects of heat loss on the body.....
- 3. The effects of heat loss on the body.....
- 4. The effects of heat loss on the body.....
- 5. The effects of heat loss on the body.....
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- 19. The effects of heat loss on the body.....
- 20. The effects of heat loss on the body.....

- 17. The selected system.....
- 18. The engineering system.....
- 19. The existing system in this country.....
- 20. The current system in this country.....
- 21. The principal functions of the new system.....
- 22. Technical details.....
- 23. Diagrams of actual processes in each industry in the
United States.....
- 24. The new process in each country.....
- 25. The new process in the United States.....
- 26. The new process in the United States.....
- 27. The new process in the United States.....
- 28. The new process in the United States.....
- 29. The new process in the United States.....
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- 31. The new process in the United States.....
- 32. The new process in the United States.....
- 33. The new process in the United States.....

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School.....
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The information covered by the preceding questionnaire
has been the subject of a report to the United States
Government by the War Relocation Authority. All of the material
collected has been placed on file in the War Relocation
Authority's files as well as in the files of the War Relocation
Administration.

southern states were included in this study.

A letter was addressed to the state supervisors or directors of the states selected, requesting permission to send the questionnaire to ten of their most successful teachers of vocational agriculture. The content and purpose of the study were explained. The questionnaire was addressed to the ten names submitted by the supervisor or director of vocational agriculture. The following shows the states included in the study, the number of questionnaires sent out and the number returned:

<u>State</u>	<u>Number Sent Out</u>	<u>Number Returned</u>
Alabama	10	0
Arkansas	0	0
California	10	0
Connecticut	10	1
Delaware	10	1
Georgia	10	0
Illinois	11	0
Colorado	10	1
Illinois	00	07
Kentucky	10	1
Maryland	0	0
Michigan	11	0
Missouri	10	4
Montana	10	0
Nebraska	10	4
North Dakota	10	0
New York	10	4
Ohio	10	1
South Dakota	10	0
Wyoming	11	0
Total	200	110

[illegible]

Foot are listed in tabular form.

The following table graphically illustrates the above-
mentioned results and shows that about a 50% increase in the
number of eggs is caused by the addition of 1/1000 of a gram of
the growth.

So when he makes a great business the money that
he's making he's not at all happy, a great deal
more than a lot of money, a great deal, a lot of it.

[illegible][illegible]

Handwritten musical score for "The Rose Tree". The score is written on ten staves. The notation is in a simplified, early form of musical notation, possibly a precursor to modern notation. The melody is written on the first staff, and the lyrics are written below the staves. The score is divided into measures by vertical bar lines. The handwriting is in dark ink on aged, slightly yellowed paper.

100

The image shows a page from a handwritten manuscript. The text is written in a cursive script, likely from the 18th or 19th century, on a page with horizontal ruling. The handwriting is dense and fills most of the page. There are some vertical lines or markings that appear to be part of the text or perhaps corrections. The paper is aged and slightly discolored.

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

The image shows a page from a handwritten manuscript. The text is written in a cursive script on lined paper. The layout is characterized by a complex, multi-level branching structure. A main horizontal line at the top branches into several vertical lines that descend to connect to subsequent horizontal lines, creating a tree-like or branching pattern. The handwriting is dense and fills most of the page.


17

The diagram illustrates a complex system of lines and connections, possibly representing a mechanical or electrical circuit. It features several horizontal lines, some of which are connected by vertical lines, creating a stepped or cascading effect. The handwriting is in a cursive script, likely from the 18th or 19th century.

[illegible]

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TABLE I, PAGE 2, BACTERICIDAL-CONTINUED:



The image shows a page from the Voynich manuscript, featuring several lines of text written in the Voynich script. The text is arranged in a structured format, possibly a list or a series of entries, with some lines starting with a small symbol. The handwriting is consistent throughout the page.

A black and white photograph of a page from a manuscript. The page features a large, ornate initial 'C' in the left margin, followed by several lines of text in a Gothic script. The text is written in a single column, with some lines starting with smaller initials. The parchment appears aged and slightly discolored.

A black and white photograph of a musical score manuscript. The score is written on ten staves, with the first staff containing a treble clef and a key signature of one sharp (F#). The notation includes various musical symbols such as notes, rests, and bar lines. The manuscript is handwritten and appears to be a page from a larger work.

A musical score for a string quartet, featuring four staves with handwritten musical notation. The notation includes various notes, rests, and dynamic markings, with some parts of the score being cut off on the right side.

100

This image shows a page from the Voynich manuscript, featuring a large table with multiple rows and columns of text written in the Voynich script. The text is dense and fills most of the page area.

0.35

_____ per _____ of _____, _____, _____.

1. *Journal of the American Medical Association*, 1997; 277: 100-101.
 2. *Journal of the American Medical Association*, 1997; 277: 100-101.
 3. *Journal of the American Medical Association*, 1997; 277: 100-101.
 4. *Journal of the American Medical Association*, 1997; 277: 100-101.
 5. *Journal of the American Medical Association*, 1997; 277: 100-101.

1997

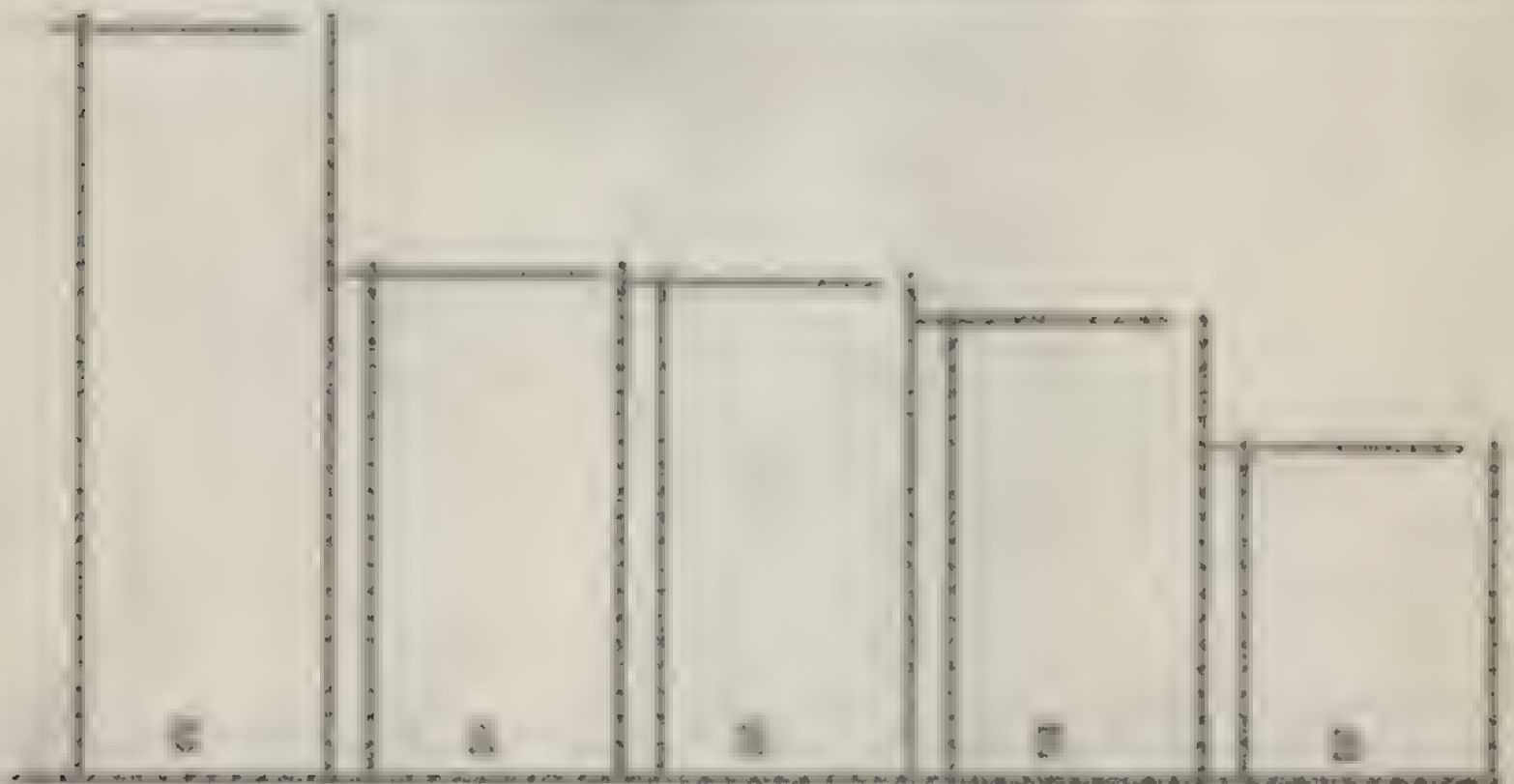
... ..

and a third series is made of one. The total of these readings established the setting of the subject. This subject was indicated within the larger graph by a one-quarter inch scale. Only the first five minutes of the subject period according to experiment were indicated.

Table II indicates that bacteriological facts are taught by 84.1 per cent of the teachers of vocational agriculture departments. Of all principles taught the least frequency of any one was 10 per cent. The bacteria cause disease of animals was listed most frequently by these questions, at the least was the greatest number of teachers taught this fact. "Bacteria defined" was in the second place. Further more it indicates that these facts dealing with directly with the practical application of these facts to agriculture were given preference. Facts dealing with the department of bacteria to animal production and to their control were consistently dependent. From a study of the above table, bacteriology is a subject most stressed by vocational agriculture teachers.

Laboratory exercises were used most extensively in teaching the facts in bacteriology. Lecture methods were used more often to teach these facts dealing with the more abstract problems such as "Bacteria defined", "The bacteria reproduce", and "The bacteria live, where they, eliminate

LOAN 11, INTEREST BEARING THROUGHOUT ON THE ASSUMPTION
THAT THE BORROWER WILL BE IN POSSESSION OF THE PROPERTY
UNTIL THE FULL PAYMENT OF THE LOAN IS MADE.
THE BORROWER AGREES TO PAY THE INTEREST ON THE LOAN
ON THE DATES SPECIFIED HEREIN.

[illegible][illegible]

of many such facts by the methods indicated.

Botany

In teaching botany as a related science to the animal production course, we find that most teachers lay emphasis upon "materials of which plant foods are made". Thirty per cent of the teachers questioned teach this principle of botany. While 21 also indicates that little emphasis is placed upon such botanical principles as "The most important elements in each type of feed and how it is important to animal metabolism". Even less consideration is given to teaching "The nutritional value of plants as related to the livestock industry." The more applicable principles of botany are given preference over the more abstract and botanical facts.

In the use of teaching methods used in presenting these principles of botany, we find that 'conversational study and recitation' is most frequently used. 'Assigned reading and recitation' and the 'lecture' methods come in the second and third choice respectively. The use of 'illustration' as a supplementary method ranked fourth and the 'laboratory' exercises method is fifth in importance as a teaching device. The principles of botany selected as relative to the animal production course are in themselves somewhat abstract. This

1. The first step in the process of the project is to identify the problem and the objectives of the project. This is done by the project manager and the team members. The next step is to develop a project plan, which includes a timeline, a budget, and a risk management plan. The project manager then assigns tasks to the team members and monitors their progress. The final step is to evaluate the project and report the results to the stakeholders.

2. The second step in the process of the project is to develop a project plan. This is done by the project manager and the team members. The project plan includes a timeline, a budget, and a risk management plan. The project manager then assigns tasks to the team members and monitors their progress. The final step is to evaluate the project and report the results to the stakeholders.

3. The third step in the process of the project is to assign tasks to the team members. This is done by the project manager. The project manager assigns tasks to the team members based on their skills and experience. The project manager also monitors the progress of the team members and provides support when needed. The final step is to evaluate the project and report the results to the stakeholders.

4. The fourth step in the process of the project is to monitor the progress of the team members. This is done by the project manager. The project manager monitors the progress of the team members and provides support when needed. The project manager also reports the progress of the team members to the stakeholders. The final step is to evaluate the project and report the results to the stakeholders.

5. The fifth step in the process of the project is to evaluate the project and report the results to the stakeholders. This is done by the project manager. The project manager evaluates the project and reports the results to the stakeholders. The project manager also provides feedback to the team members and identifies areas for improvement. The final step is to evaluate the project and report the results to the stakeholders.

6. The sixth step in the process of the project is to provide feedback to the team members and identify areas for improvement. This is done by the project manager. The project manager provides feedback to the team members and identifies areas for improvement. The project manager also reports the feedback to the stakeholders. The final step is to evaluate the project and report the results to the stakeholders.

7. The seventh step in the process of the project is to report the results to the stakeholders. This is done by the project manager. The project manager reports the results to the stakeholders and provides feedback to the team members. The project manager also identifies areas for improvement. The final step is to evaluate the project and report the results to the stakeholders.

1000 111, 100 1, 1000-1000000

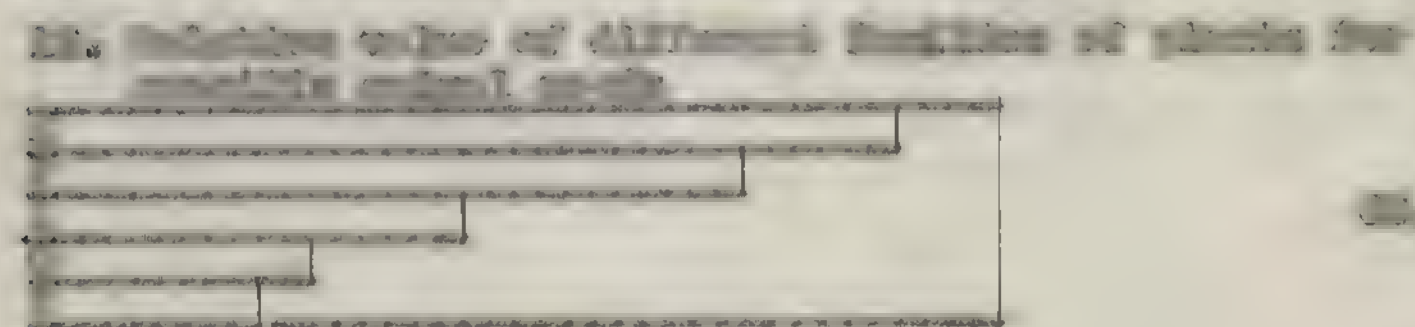
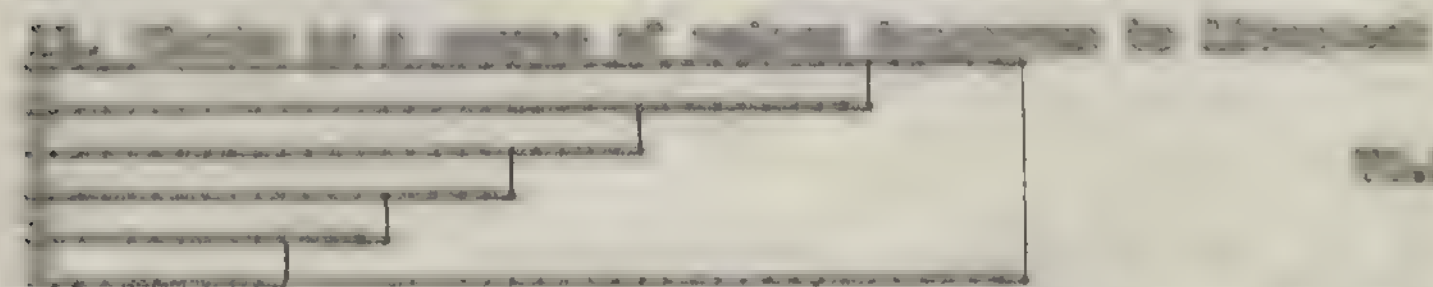
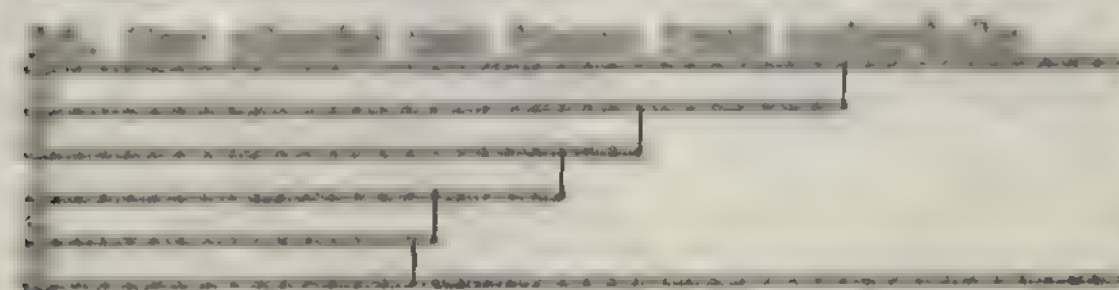
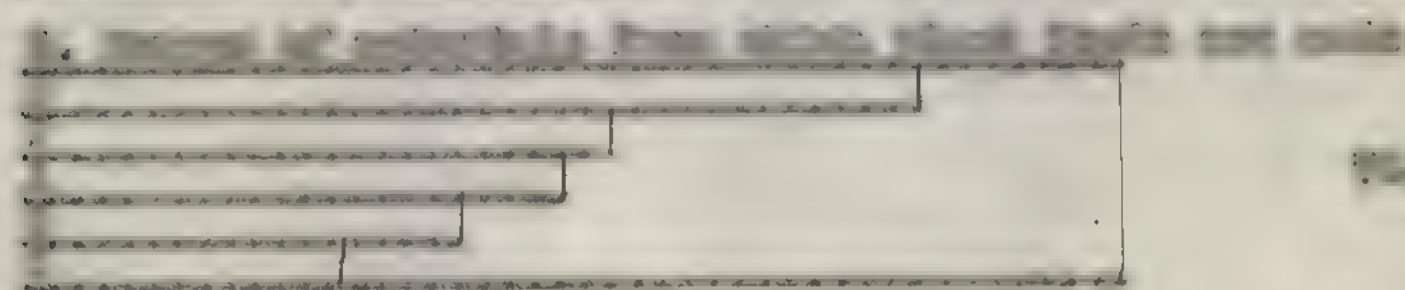
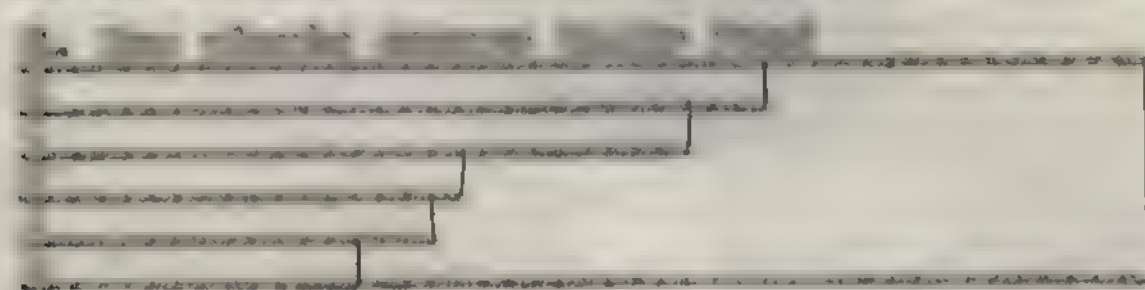
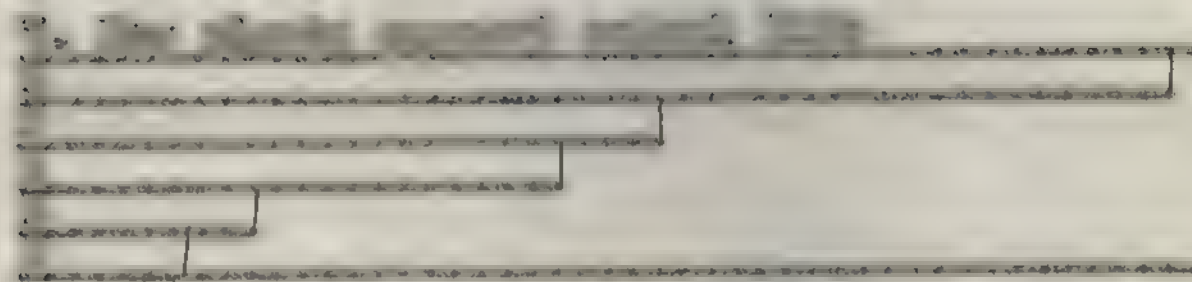
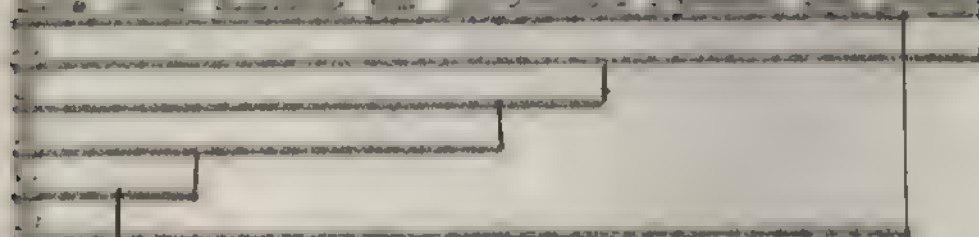


TABLE III, PART 3, SUMMARY-CONTINUED

13. The kinds of projects found in plants that are important



85.0%

14. The relative importance of different kinds of activities found in plants



85.0%

15. The most important element in each type of food found in plants and how it is important to animal metabolism



85.0%

16. The medicinal value of plants as related to the live-stock industry



85.0%

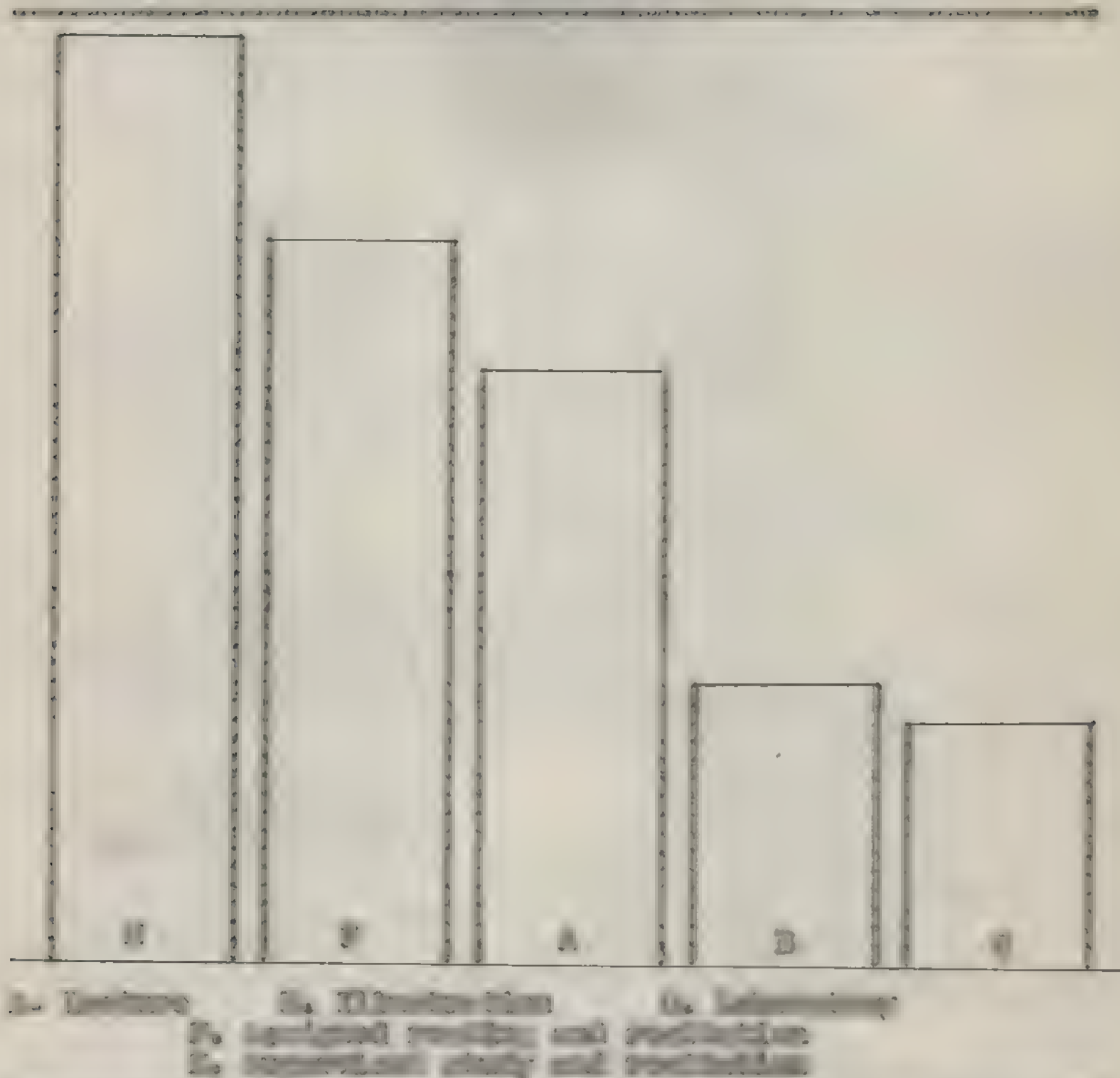
Percentages per cent of teachers mentioned the topic this fact.

Legend: L-Lecture
D-Demonstration
C-Laboratory

I-Illustration
R-Form Recitation
F-Assigned Reading and Recitation

S-Field Study
W-Worked Study and Recitation

NOTE: THE ABOVE FIGURE IS A SUMMARY OF THE RESEARCH
 FINDINGS WHICH ARE BEING PRESENTED IN THE SPECIAL ISSUE
 OF A JOURNAL OF SOCIAL PSYCHOLOGY IN PROGRESS.



THEY CONCLUDE THAT THE FACT THAT THE ABOVE FIGURE AND OTHER
 FINDINGS ARE NOT AS DIFFICULT AS THEY ARE.

Chemistry

The principles of chemistry related to the animal production course are, from the reference included in Table I, very important in the study and execution of most vocational agricultural practices. This evaluation is based first on the fact that 25.0 per cent of the teachers listed are in all of the vocational fields listed in the questionnaire and Table I. "How the animal body uses food", "How the animal body uses proteins", "How the animal body uses carbohydrates" and "Vitamins, their value and where found" are mentioned by most teachers as being of primary importance. These principles of chemistry are the basic facts underlying the food and feeding jobs in an animal production course. The above four important principles of chemistry are directly applicable to the proper performance of the vocational work in animal production.

Table II indicates that approximately two per cent of the "important study and teaching" and the "assigned reading and recitation" articles. The "lectures" section was as high as the study case of the more abstract facts. This is due to the fact that Table I, which indicates that most teachers used the "lectures" method in teaching such facts as "Chemistry defined", "Elements and what they are", "Compounds and what they are" and "How chemical bonds are re-

THE HISTORY OF THE UNITED STATES OF AMERICA FROM 1789 TO 1861 BY JAMES M. SMITH, LL.D. OF THE UNIVERSITY OF CHICAGO

THE HISTORY OF THE UNITED STATES OF AMERICA FROM 1789 TO 1861. BY JAMES M. SMITH, LL.D. OF THE UNIVERSITY OF CHICAGO. NEW YORK: PUBLISHED BY J. B. LIPPINCOTT & CO. 1861.

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UNIT 1, LESSON 2, VOCABULARY-REVIEW

1. The first part of the lesson is a review of the vocabulary words that you learned in the last lesson. The words are listed on the left, and you are to write the definition of each word in the space provided on the right.

75.00

2. The second part of the lesson is a review of the grammar rules that you learned in the last lesson. The rules are listed on the left, and you are to write the definition of each rule in the space provided on the right.

75.00

3. The third part of the lesson is a review of the reading strategies that you learned in the last lesson. The strategies are listed on the left, and you are to write the definition of each strategy in the space provided on the right.

4. The fourth part of the lesson is a review of the writing strategies that you learned in the last lesson. The strategies are listed on the left, and you are to write the definition of each strategy in the space provided on the right.

75.00

5. The fifth part of the lesson is a review of the speaking strategies that you learned in the last lesson. The strategies are listed on the left, and you are to write the definition of each strategy in the space provided on the right.

75.00

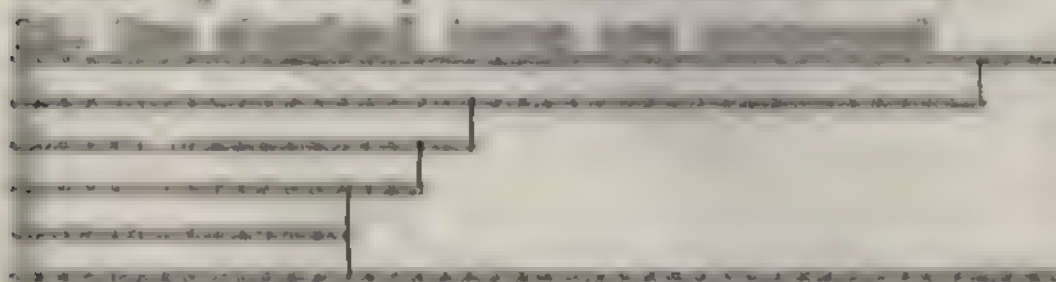
6. The sixth part of the lesson is a review of the listening strategies that you learned in the last lesson. The strategies are listed on the left, and you are to write the definition of each strategy in the space provided on the right.

75.00

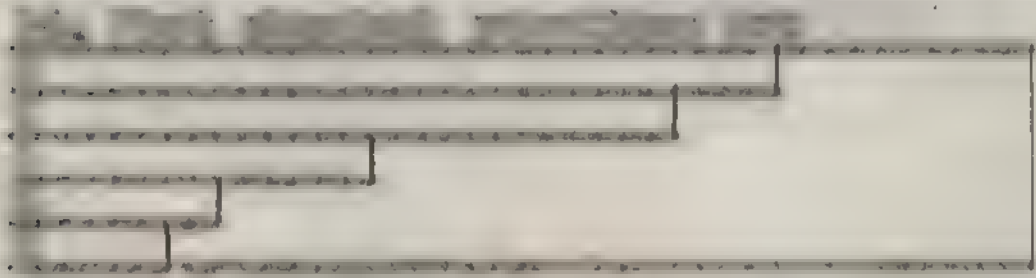
7. The seventh part of the lesson is a review of the thinking strategies that you learned in the last lesson. The strategies are listed on the left, and you are to write the definition of each strategy in the space provided on the right.

75.00

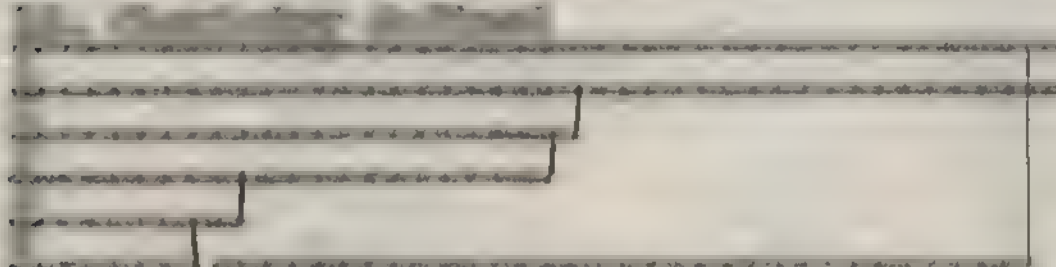
TABLE V, PAGE 3, CONTINUED-CONTINUED:



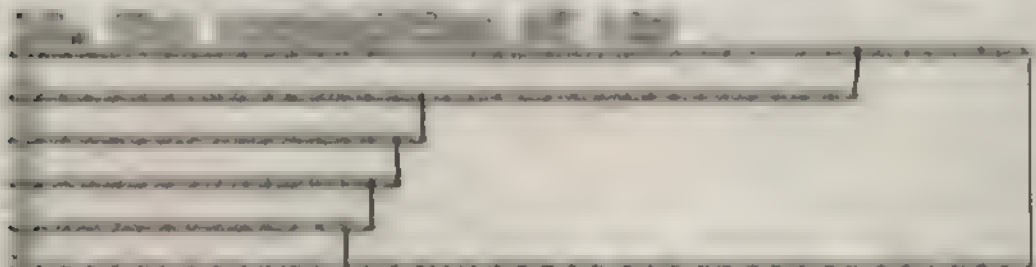
80%



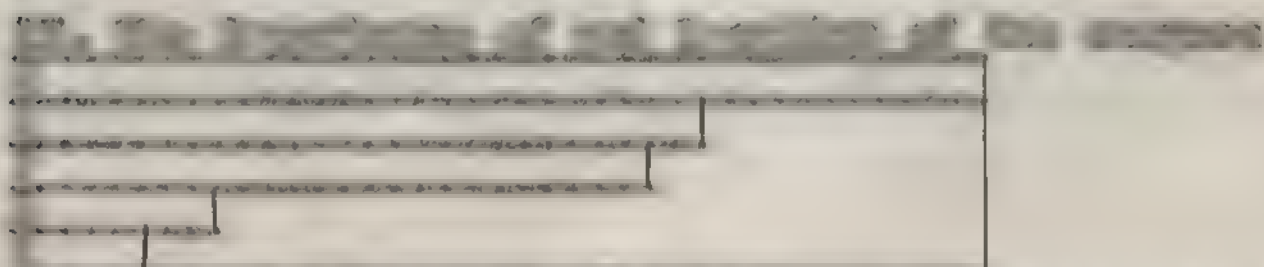
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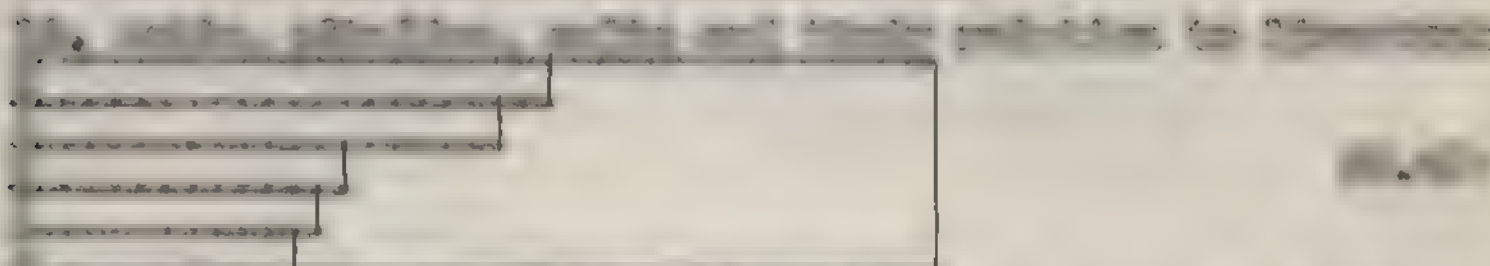
75%



55%



45%

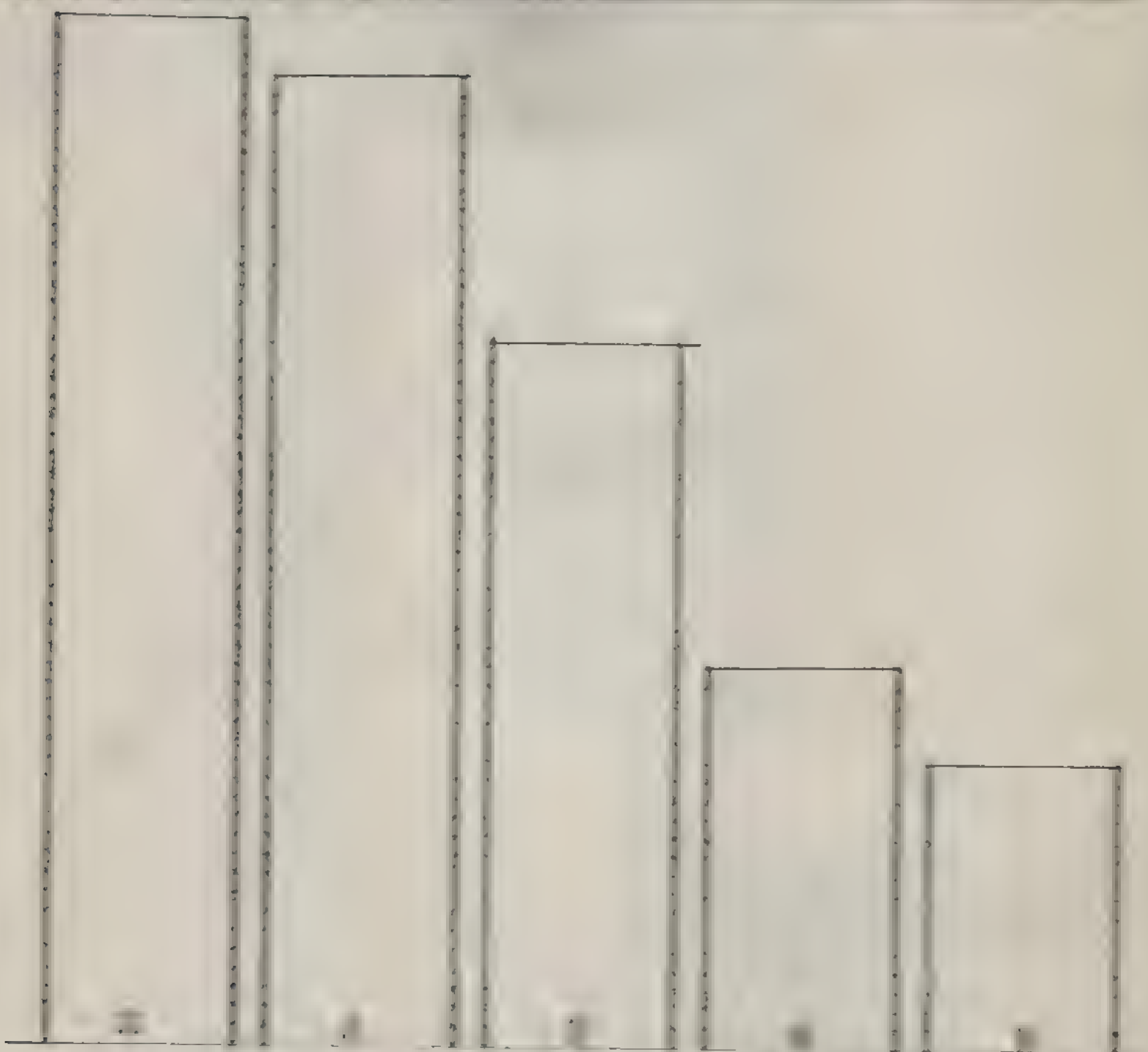


35%

Percentage of total number of students who signed the statement.

Source: Author. Information from the National Longitudinal Study of the Youth, 1990-1994. Data from the National Longitudinal Study of the Youth, 1990-1994.

NOTE: The above is a summary of the findings of the study. The full report is available in the full report. The full report is available in the full report.



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NOTE: The above is a summary of the findings of the study. The full report is available in the full report. The full report is available in the full report.

quency of use. That most vocational agriculture laboratories are not equipped for extensive use of this teaching method may account for this fact. Furthermore the laboratory method requires more time for teaching and this may be additional reason why it is not as frequently resorted to.

Entomology

Entomology is from the evidence shown on Table VII much stressed by vocational agriculture teachers as a related science to the animal production course. Table VII shows that over 90 per cent of the teachers questioned teach some or all of the scientific principles listed.

Ninety and nine-tenths per cent of the teachers consider "Life history and control measures for specific insects" as an important scientific fact of entomology and teach it in their course. "The life cycle of an insect" and "How an insect lives" were considered important. Eighty four and seventy-nine per cent, respectively, of the teachers questioned taught these two facts as part of the animal production course. "Classification of insects and their many relatives" was taught by only 66 per cent of the teachers.

From the above it is evident that the facts dealing more directly with the practical jobs of agriculture were considered more important. Insect control and the necessary information in methods of doing this were constantly given

THE ECONOMIC IMPORTANCE OF INSECTS AND THEIR RELATIVES TO
HUMAN LIFE
BY J. H. KROMBEIN

1. The economic importance of insects and their relatives to human life

The economic importance of insects and their relatives to human life is a subject of great interest and importance. It is a subject that has been studied for many years and has many practical applications. The following are some of the most important ways in which insects and their relatives are economically important to human life.

66.00

2. The economic importance of insects and their relatives to human life

The economic importance of insects and their relatives to human life is a subject of great interest and importance. It is a subject that has been studied for many years and has many practical applications. The following are some of the most important ways in which insects and their relatives are economically important to human life.

67.00

3. The economic importance of insects and their relatives to human life

The economic importance of insects and their relatives to human life is a subject of great interest and importance. It is a subject that has been studied for many years and has many practical applications. The following are some of the most important ways in which insects and their relatives are economically important to human life.

68.00

4. The economic importance of insects and their relatives to human life

The economic importance of insects and their relatives to human life is a subject of great interest and importance. It is a subject that has been studied for many years and has many practical applications. The following are some of the most important ways in which insects and their relatives are economically important to human life.

69.00

5. The economic importance of insects and their relatives to human life

The economic importance of insects and their relatives to human life is a subject of great interest and importance. It is a subject that has been studied for many years and has many practical applications. The following are some of the most important ways in which insects and their relatives are economically important to human life.

70.00

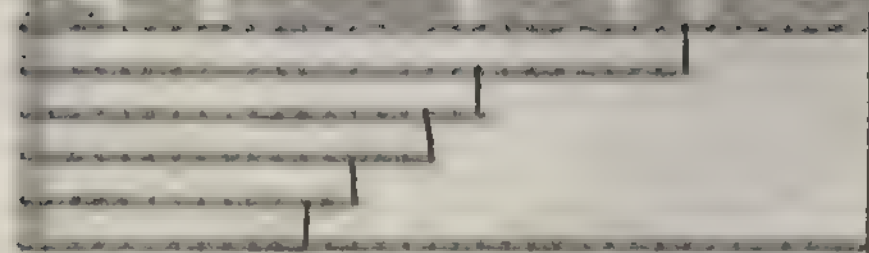
6. The economic importance of insects and their relatives to human life

The economic importance of insects and their relatives to human life is a subject of great interest and importance. It is a subject that has been studied for many years and has many practical applications. The following are some of the most important ways in which insects and their relatives are economically important to human life.

71.00

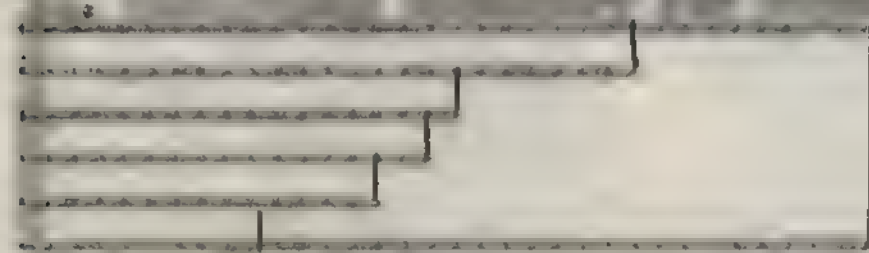
TABLE 12. THE 14 RESEARCH-DESIGN

1. The research design is experimental. Each group is given

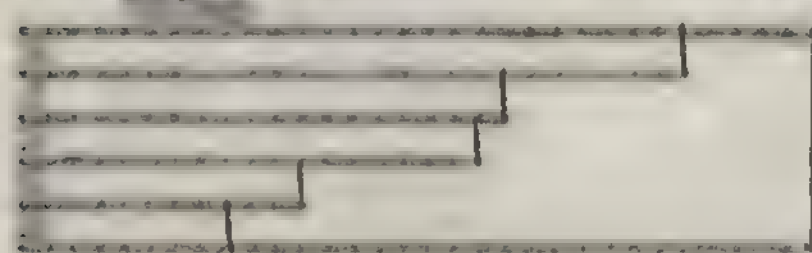


100%

2. The research design is experimental. Each group is given



3. The research design is experimental. Each group is given



100%

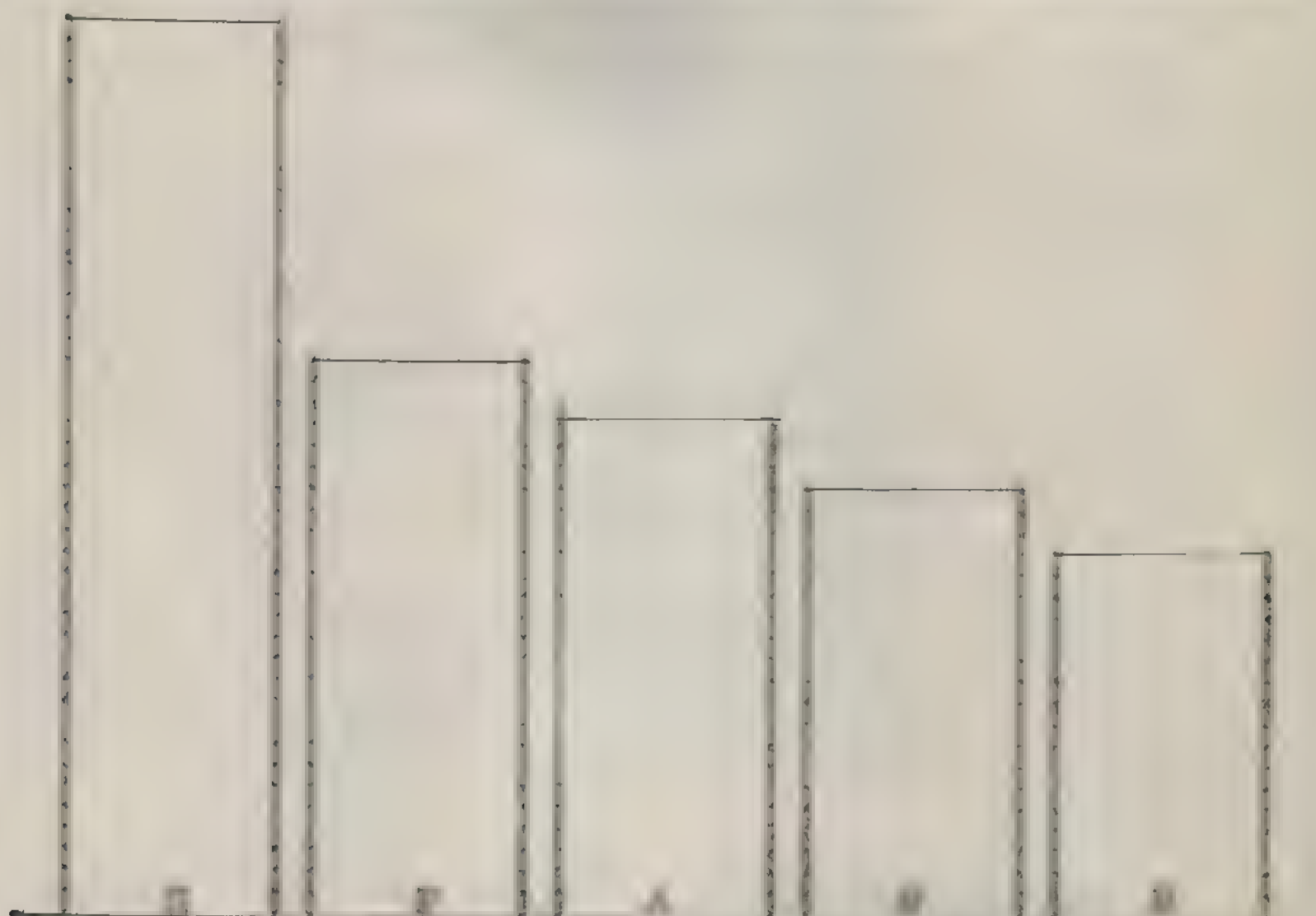
4. The research design is experimental. Each group is given

Experimental design	Experimental design	Experimental design
Experimental design	Experimental design	Experimental design
Experimental design	Experimental design	Experimental design
Experimental design	Experimental design	Experimental design
Experimental design	Experimental design	Experimental design

prominent consideration.

In examining these forms of research, the first thing to notice is that, generally, the experimental design and methodology used are not very good. There is a lot of bias in the way the data is collected and analyzed, and a lot of errors in the data. This is probably due to the differences between the two methods, and

FIGURE VIII. EFFECTS OF VARIOUS TEACHING METHODS UPON THE
 ATTAINMENT OF THE STUDENTS IN THE APPLIED
 PHYSICS COURSE, 1910-1911



1. Lecture 2. Illustration 3. Supervised study and
 recitation
 4. Assigned reading and recitation 5. Field study

and to show the results of each of these regarding the
 attainment. The highest method and that in importance
 which must never be lost. Illustrations and study in
 one of the most of the in teaching experimental work.
 The following method was given first place in the study of
 the subject. The 'highest' study, especially and in-
 ternally.

It is evident that language testing and instruction and the use of 'illuminations' are still used extensively by teachers of traditional agriculture in teaching very scientific facts of botany. From this study it is evident that scientific facts of botany are considered very important in related information in the school curriculum.

Conclusion

From the findings that various principles of genetics are taught by a considerable majority of the traditional agricultural teachers mentioned, suggestions are made to get rid of the teaching which was very vague from the teaching of 'that cross-breeding is' and 'that inheritance is'. About an equal per cent indicated that they taught 'that cross-breeding is' and 'that passing is'. The three basic principles of the science genetics were given a full mark of importance. Finally all three principles are very hard to use them in order to show the laws of inheritance more clearly. These principles of genetics are to be considered as a more practical science. They can be easily be more readily accepted by the average traditional agricultural by the use of the more practical facts of genetics such as 'that is a parent', 'that is a species' or 'that is a hybrid'. These facts were taught by very many per cent

THESE ARE THE NAMES OF THE PERSONS WHOSE NAMES ARE
APPEARING IN THE LIST OF THE NAMES OF THE PERSONS
WHO ARE THE OWNERS OF THE PROPERTY OF THE
STATE OF NEW YORK.

1

Handwritten musical notation on five staves, likely from a medieval manuscript. The notation is written in a cursive, handwritten style on five-line staves. The page is numbered '1' in the top left corner. The handwriting is in a dark ink, and the paper appears aged and slightly discolored. The musical notation consists of various notes, rests, and bar lines, typical of early manuscript notation.

TABLE 1. *Mean (SD) Age-Related Changes in the Physical and Psychological Characteristics of the Participants*

Handwritten musical score for "The Rose Tree" on a five-line staff. The notation is in a simplified, early form of musical notation, possibly a precursor to modern notation. The melody is written on the staff, and there are some markings below the staff that might be lyrics or performance instructions. The paper is aged and yellowed.



The Rose Tree

•

Handwritten musical score for "The Rose Tree" on six staves. The notation is in a historical style with various note values and rests. The score is written on six five-line staves, with some staves having a single line of music and others having multiple lines. The music is written in a dark ink on aged paper.

1. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

The Rose Tree

A black and white photograph of a document page. The page features a series of horizontal lines, likely for writing. There is a vertical line on the right side, creating a margin. The page appears to be mostly blank, with some faint, illegible markings and a vertical line on the right side.



4-2-2
 4-2-3

THE HISTORY OF THE UNITED STATES

CHAPTER I. THE DISCOVERY OF AMERICA

The first discovery of America was made by Christopher Columbus in 1492. He sailed from Spain in search of a westward route to the Indies. On October 12, 1492, he landed on the island of San Salvador in the West Indies. This event marked the beginning of European exploration and settlement in the Americas.

1492

CHAPTER II. THE EARLY YEARS OF THE COLONIES

The early years of the colonies were marked by struggle and hardship. The settlers faced many difficulties, including lack of food, shelter, and protection from Native Americans. Despite these challenges, the colonies grew and developed, laying the foundation for the future United States.

1607

CHAPTER III. THE STRUGGLE FOR INDEPENDENCE

The struggle for independence began in 1776. The colonies declared their independence from Great Britain and fought the Revolutionary War. The war ended in 1781 with the British surrender at Yorktown. The United States was born.

1776

CHAPTER IV. THE CONSTITUTION

The Constitution was drafted in 1787 and ratified in 1789. It established the framework for the federal government and the rights of the states. The Constitution has since been amended several times to adapt to the changing needs of the nation.

1787

CHAPTER V. THE CIVIL WAR

The Civil War was fought from 1861 to 1865. It was a conflict between the Union and the Confederacy over the issue of slavery. The Union emerged victorious, and slavery was abolished. The war had a profound impact on the nation's history and identity.

1861

CHAPTER VI. THE RECONSTRUCTION PERIOD

The Reconstruction Period followed the Civil War, lasting from 1865 to 1877. It was a time of rebuilding the South and integrating African Americans into the nation. The period was marked by significant challenges and progress.

1865

1470100

Regard to a related subject in the actual presentation made in traditional approaches, it was stressed as well as other subjects, according to Table II 57 per cent of the teachers considered that this as a related subject. This topic as a possible' was the principle level in learning of being taught. This principle relating closely to this study finding process also raised high. This is reflected by the mean and SD's scores, which are, 'This is very good' and 'This is including interests for actual topic' related principle involving this case of research literature are considered least important. Also it was one of the teachers considered taught the related features in their classes. Additionally, regarding the data upon the principles involved in one of our educational institutions such as the exact procedure, the selection, with content, and lesson delivery. Again it was that the more actually logical principles of physics were stressed.

The Government also has indicated that the joint effort should be given more weight in the plan, as well as other efforts, based on the results of the study. The study is being and will be a major effort. The Government has indicated that the study will be a major effort.

THESE ARE THE RESULTS OF THE RESEARCH WORK OF THE
INSTITUTE OF MATHEMATICS OF THE UNIVERSITY OF TORONTO
PUBLISHED BY THE INSTITUTE OF MATHEMATICS OF THE UNIVERSITY OF TORONTO
IN 1954

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IN 1954

7. The proposed regulatory approach to the proposed product is:

1. $\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$
 2. $\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$
 3. $\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$
 4. $\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$
 5. $\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$
 6. $\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$

1990

1. *Statistical significance* indicates a 95% or greater chance of finding a difference between groups.

Handwritten notes on lined paper, showing several lines of text that are mostly illegible due to blurring and fading. The text appears to be a list or series of entries, possibly related to a study or research project.

10

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The Rose Tree

10

北京 100029

The image shows a single page of a handwritten manuscript. The text is written in a cursive script on five lines. The paper is aged and yellowed. The handwriting is fluid and connected. The lines of text are separated by small gaps. The ink is dark. The overall appearance is that of a historical document or a personal letter.

As part of your selection for the job, you

The Rose Tree

10. *Journal of the American Medical Association*, 277:1033-1034, 1996

A handwritten musical score for the song "The Rose Tree". The score is written on five staves. The first staff is a single line with a treble clef and a key signature of one flat (B-flat). The second staff is a single line with a treble clef and a key signature of one flat. The third staff is a single line with a treble clef and a key signature of one flat. The fourth staff is a single line with a treble clef and a key signature of one flat. The fifth staff is a single line with a treble clef and a key signature of one flat. The music is written in a simple, handwritten style, with notes and rests clearly visible. The lyrics "The Rose Tree" are written below the staves.

12

PAGE 12, LINE 8, DELETED-CONTINUED:

1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

A musical score for a string quartet, showing five staves with handwritten musical notation. The notation includes various notes, rests, and dynamic markings, with some parts of the score being cut off on the right side.

100

...the

The image shows a single page from a handwritten manuscript. It features a musical score written on six horizontal staves. The notation is in a historical style, likely from the 16th century, using a system of square neumes on a four-line staff. The melody is highly complex and features a series of sharp, vertical leaps between staves, creating a stepped appearance. The ink is dark, and the paper is aged and slightly discolored. The handwriting is in a cursive script, typical of the period.

100

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CA. 554

12. The Federal Reserve Bank of New York is responsible for the day-to-day operations of the Federal Reserve System.

1. Estimated percentage of length of leg and girth

A handwritten musical score for the song "The Rose Tree". The score is written on five-line staves. The first staff begins with a treble clef and a key signature of one flat (B-flat). The melody is written in a simple, folk-like style. The lyrics "The Rose Tree" are written below the first staff. The score continues with several more staves, each with its own line of lyrics. The handwriting is in cursive and appears to be from a 19th-century manuscript.

35.055

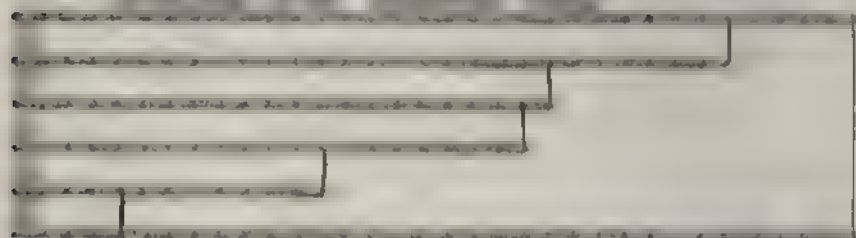
1. **THEORY**

Handwritten musical notation on five-line staves. The notation includes various note values (quarter, eighth, sixteenth notes), rests, and bar lines. The handwriting is in dark ink on aged, slightly yellowed paper. The notation is arranged in a single system across five staves.

1992

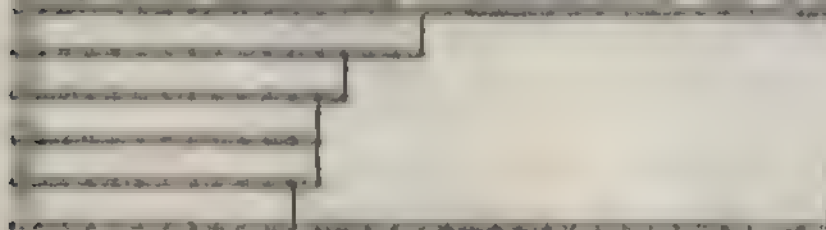
TABLE XI, PAGE 4, INDEXES-CONTINUED:

18. The time needed for a person to complete the work of the day.



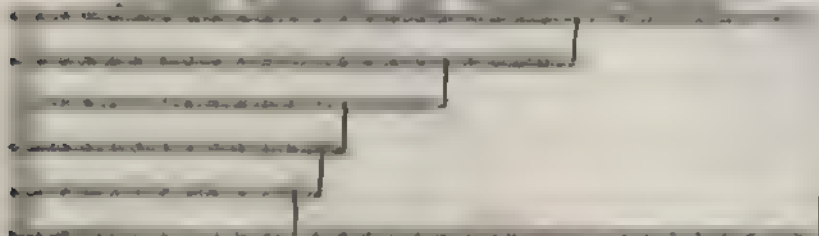
01.00

19. The amount of material of good quality.



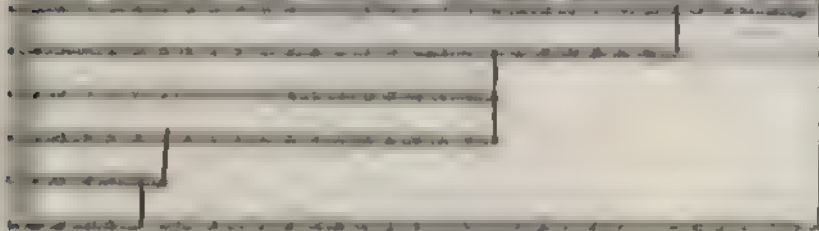
01.25

20. The amount of material in the production of iron and steel.



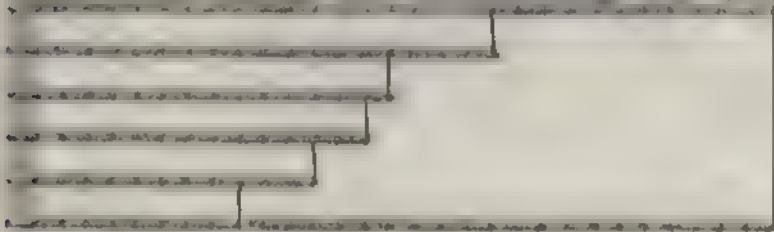
01.25

21. The amount of material in the production of iron and steel.



01.25

22. The amount of material in the production of iron and steel.



01.25

23. The amount of material in the production of iron and steel.



01.25

Q. Now, did you know the value of the building?

A. Yes, I did know the value of the building.



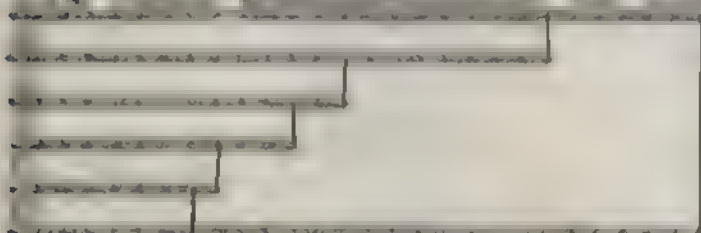
Q. Now, did you know the value of the building?

A. Yes, I did know the value of the building.



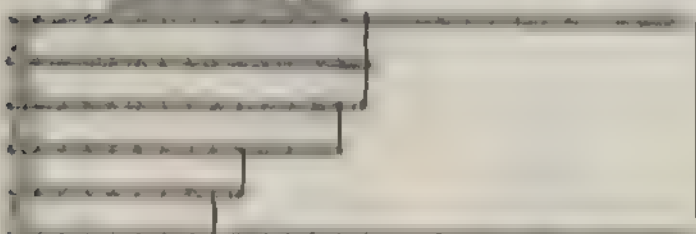
Q. Now, did you know the value of the building?

A. Yes, I did know the value of the building.



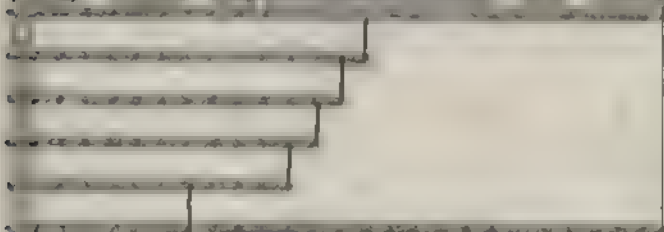
Q. Now, did you know the value of the building?

A. Yes, I did know the value of the building.



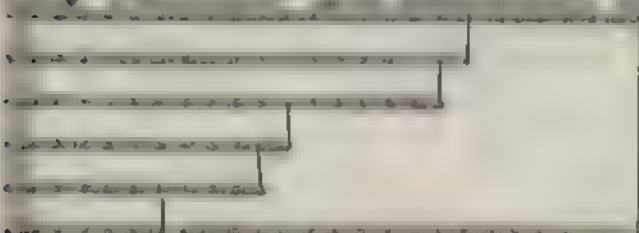
Q. Now, did you know the value of the building?

A. Yes, I did know the value of the building.



Q. Now, did you know the value of the building?

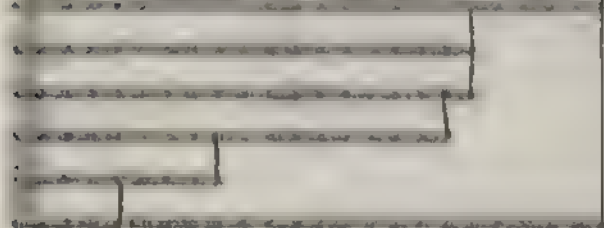
A. Yes, I did know the value of the building.



Q. Now, did you know the value of the building?

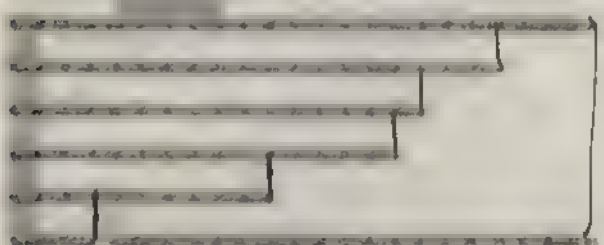
TABLE III, PAGE 6, MIL-250-CONTINUED:

1. ~~TABLE III, PAGE 6, MIL-250-CONTINUED:~~ of animals



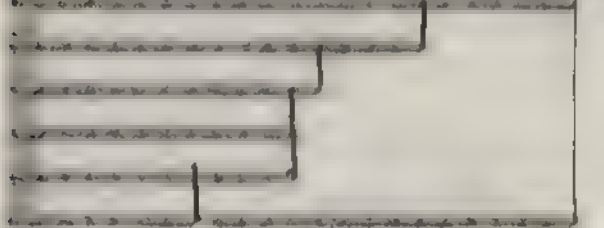
41.8%

2. ~~TABLE III, PAGE 6, MIL-250-CONTINUED:~~ as various



40.3%

3. ~~TABLE III, PAGE 6, MIL-250-CONTINUED:~~ condensation of moisture



40.0%

4. ~~TABLE III, PAGE 6, MIL-250-CONTINUED:~~ as bases for forecasts



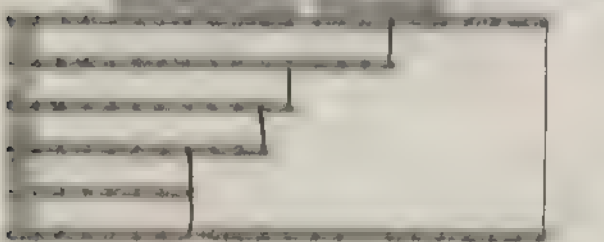
40.0%

5. ~~TABLE III, PAGE 6, MIL-250-CONTINUED:~~ as various



38.3%

6. ~~TABLE III, PAGE 6, MIL-250-CONTINUED:~~ as various



38.3%

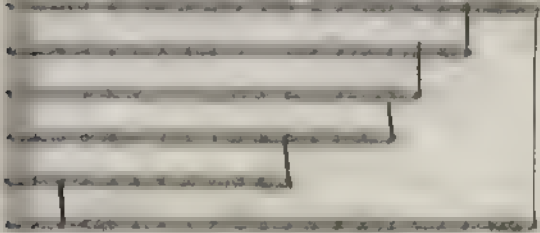
2002 12, 2003 1, 2004-2005

1. The Commission has



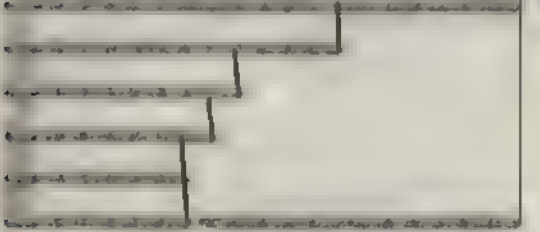
1.1

2. The Commission has



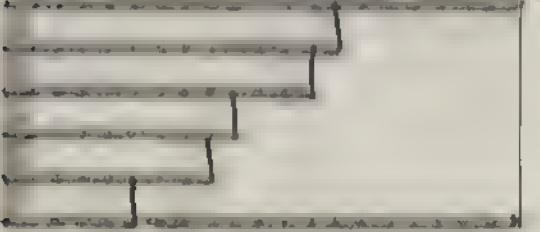
1.2

3. The Commission has



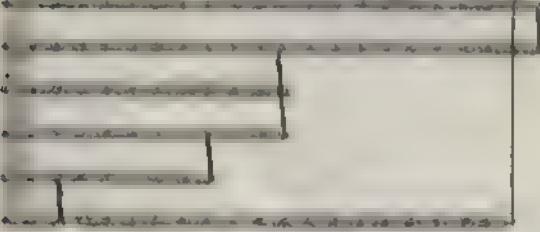
1.3

4. The Commission has



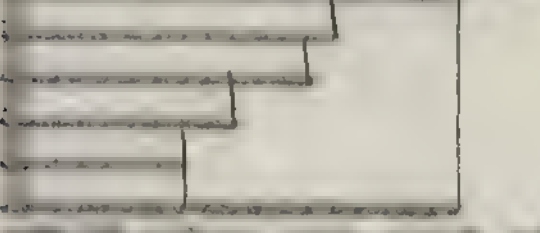
1.4

5. The Commission has



1.5

6. The Commission has



1.6

7. The Commission has

8. The Commission has

helpful methods as follows in teaching:

From a study of Table II it can be seen that emphasis placed on the teaching of principles of physics is reflected in the actual percentage correct range from 17.3 per cent to the case of "Sunlight as a phenomenon" to 32.3 per cent and in the case of "Knowing just the varying kinds of clouds in weather observation."

Zoology

The biology is considered an important subject related to the actual production course in vocational agriculture is revealed by a study of Table III. Eighty-one per cent of the vocational agriculture teachers questioned made use or more of the more important principles of the subject. "The level of actual knowledge" was judged by the percent correct of teachers. "The correct answer is from students" was considered the best response of all items listed. Only 27 per cent taught this principle of zoology. "The actual percentage 11st" and "Knowledge in from students" were considered as about equal importance. Thirty-one per cent of the teachers indicated that they would have no students in their classes.

From a study of Table III it can be seen that the use of the practical study and collection of actual material was revealed by vocational agriculture teachers in presenting any of the

THESE LISTS, WHICH ARE SUBMITTED TO THE BOARD OF
 AGENCIES IN CONNECTION WITH A REPORT ON THE
 STATE OF THE AGENCY, ARE THE ONLY RECORDS
 WHICH ARE OF ANY VALUE TO THE AGENCY.

THESE LISTS ARE SUBMITTED TO THE BOARD OF AGENCIES IN CONNECTION WITH A REPORT ON THE STATE OF THE AGENCY.

NAME	AGE	SEX	RELATION	EDUCATION	INDUSTRY	RELIGION	ETHNICITY	LANGUAGE	STATUS
1. John Doe	25	M	Head of Family	High School	Farmer	Protestant	White	English	Free
2. Mary Doe	22	F	Wife	High School	Homemaker	Protestant	White	English	Free
3. John Doe	18	M	Son	High School	Farmer	Protestant	White	English	Free
4. Mary Doe	15	F	Daughter	High School	Homemaker	Protestant	White	English	Free
5. John Doe	12	M	Son	High School	Farmer	Protestant	White	English	Free
6. Mary Doe	10	F	Daughter	High School	Homemaker	Protestant	White	English	Free

CL. 100

NAME	AGE	SEX	RELATION	EDUCATION	INDUSTRY	RELIGION	ETHNICITY	LANGUAGE	STATUS
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CL. 100

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CL. 100

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CL. 100

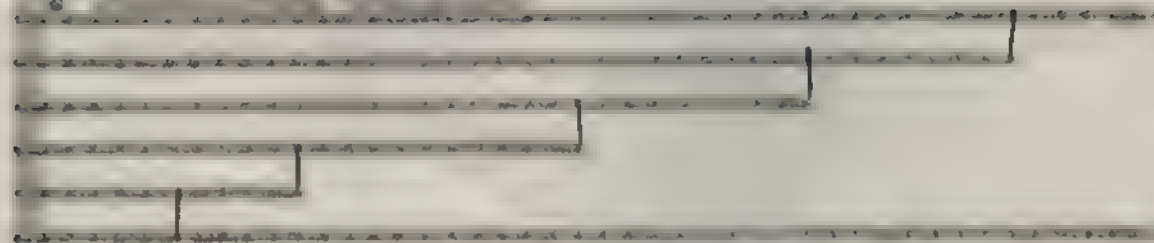
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CL. 100

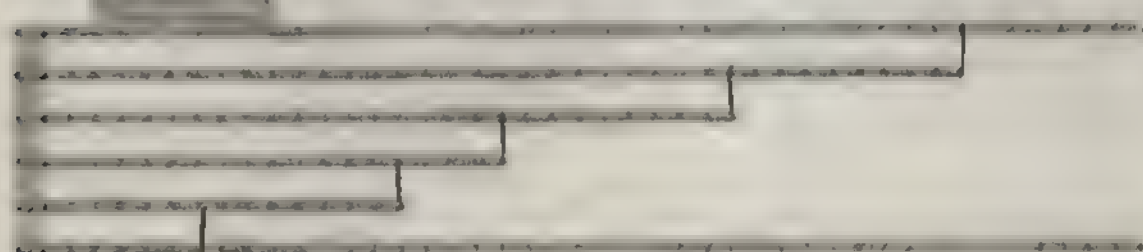
Page 122, 100 to 100-1000000

1. 100 to 100-1000000



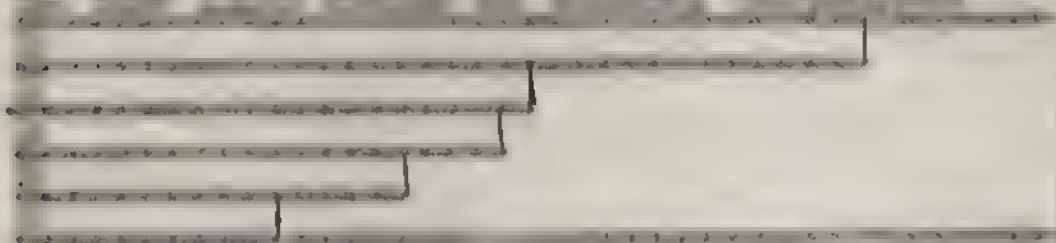
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2. 100 to 100-1000000



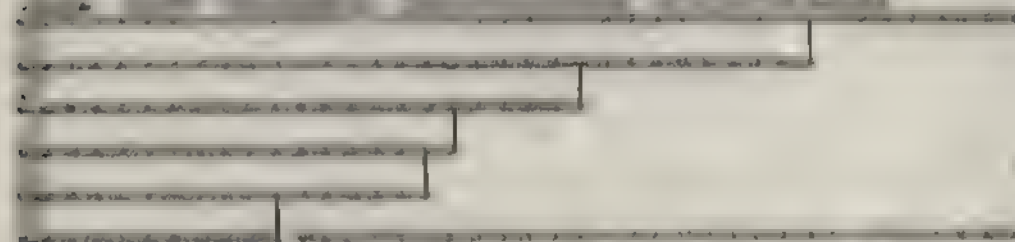
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3. 100 to 100-1000000



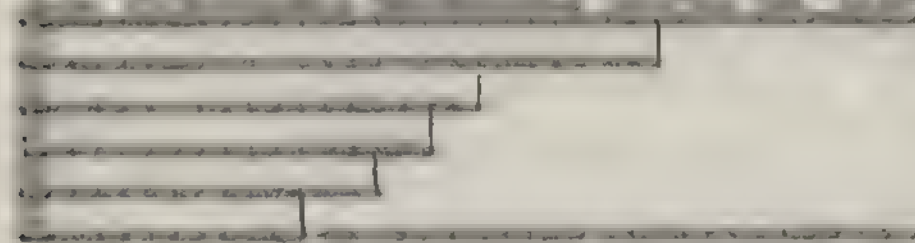
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4. 100 to 100-1000000



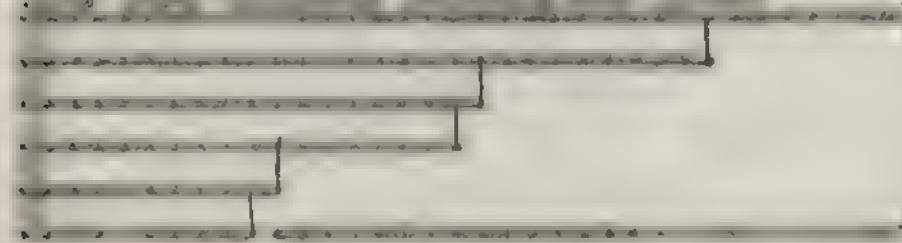
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5. 100 to 100-1000000



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6. 100 to 100-1000000



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TABULAR INDEX, PAGE 3, ENCLOSURE-CONTINUOUS;

1. General outline and detailed description of the subject

1.1. General outline	1.1.1. General outline
1.2. Detailed description	1.2.1. Detailed description
1.3. Summary	1.3.1. Summary

10-30

2. The historical background and the function in the subject

2.1. Historical background	2.1.1. Historical background
2.2. Function in the subject	2.2.1. Function in the subject
2.3. Summary	2.3.1. Summary

10-30

3. The structure of the subject in the form of a diagram

3.1. Structure of the subject	3.1.1. Structure of the subject
3.2. Diagram	3.2.1. Diagram
3.3. Summary	3.3.1. Summary

10-30

4. The historical background and the function in the subject

4.1. Historical background	4.1.1. Historical background
4.2. Function in the subject	4.2.1. Function in the subject
4.3. Summary	4.3.1. Summary

10-30

5. The structure of the subject in the form of a diagram

5.1. Structure of the subject	5.1.1. Structure of the subject
5.2. Diagram	5.2.1. Diagram
5.3. Summary	5.3.1. Summary

10-30

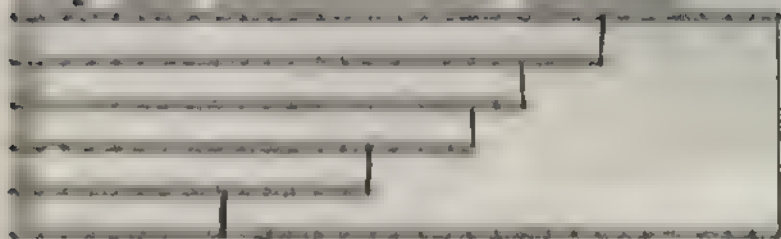
6. The structure of the subject

6.1. Structure of the subject	6.1.1. Structure of the subject
6.2. Summary	6.2.1. Summary

10-30

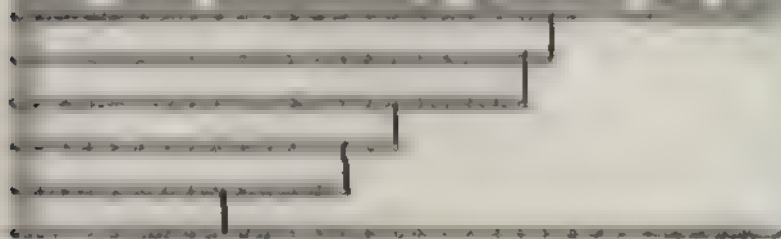
THE LATE, EARLY, AND MIDDLE PERIODS

1. The Late Period



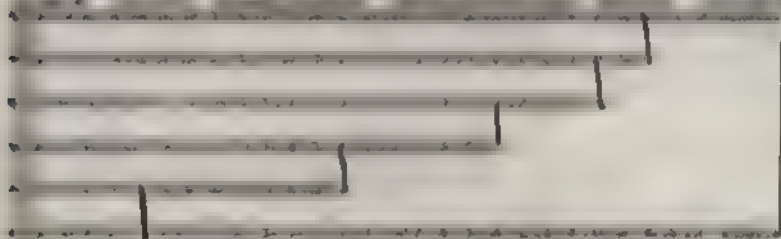
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2. The Middle Period



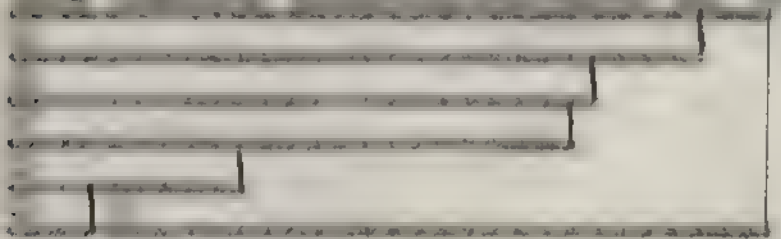
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3. The Early Period



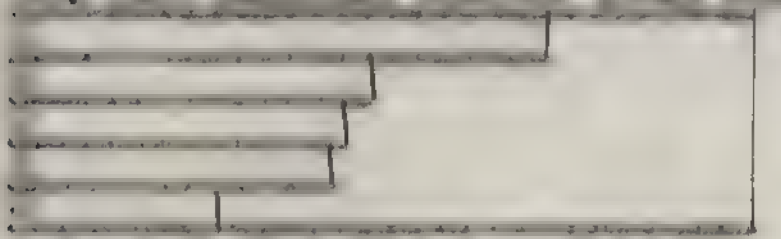
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4. The Late Period



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5. The Middle Period



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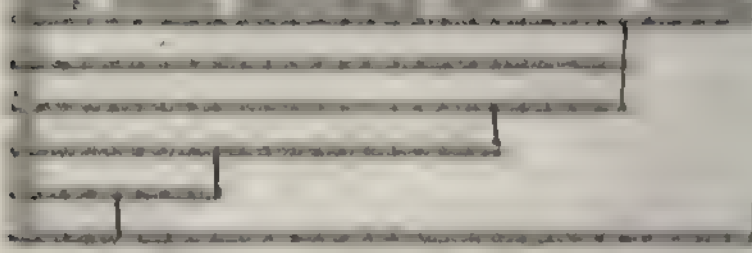
6. The Early Period



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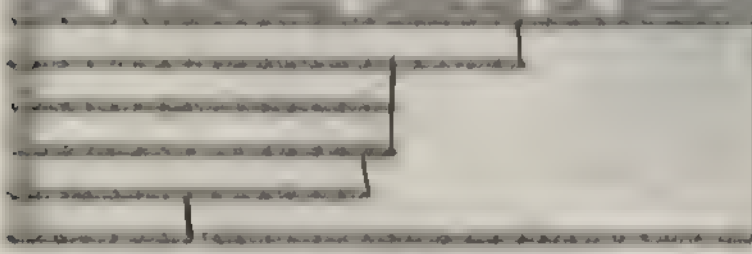
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1. The first 1000 hours of the study were devoted to the



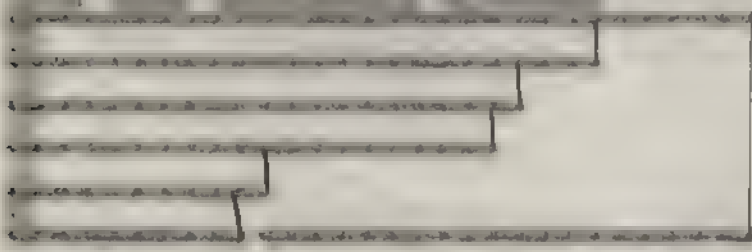
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2. The next 1000 hours of the study were devoted to the



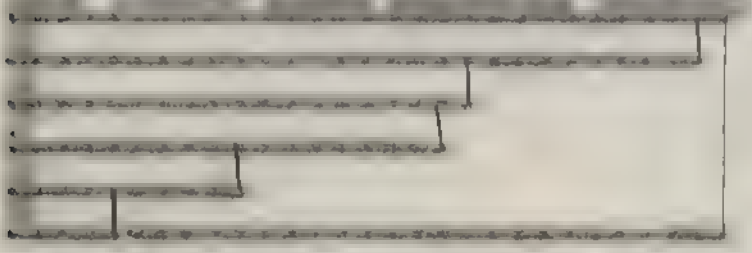
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3. The next 1000 hours of the study were devoted to the



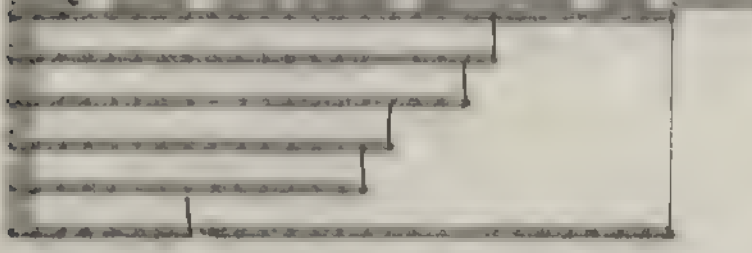
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4. The next 1000 hours of the study were devoted to the



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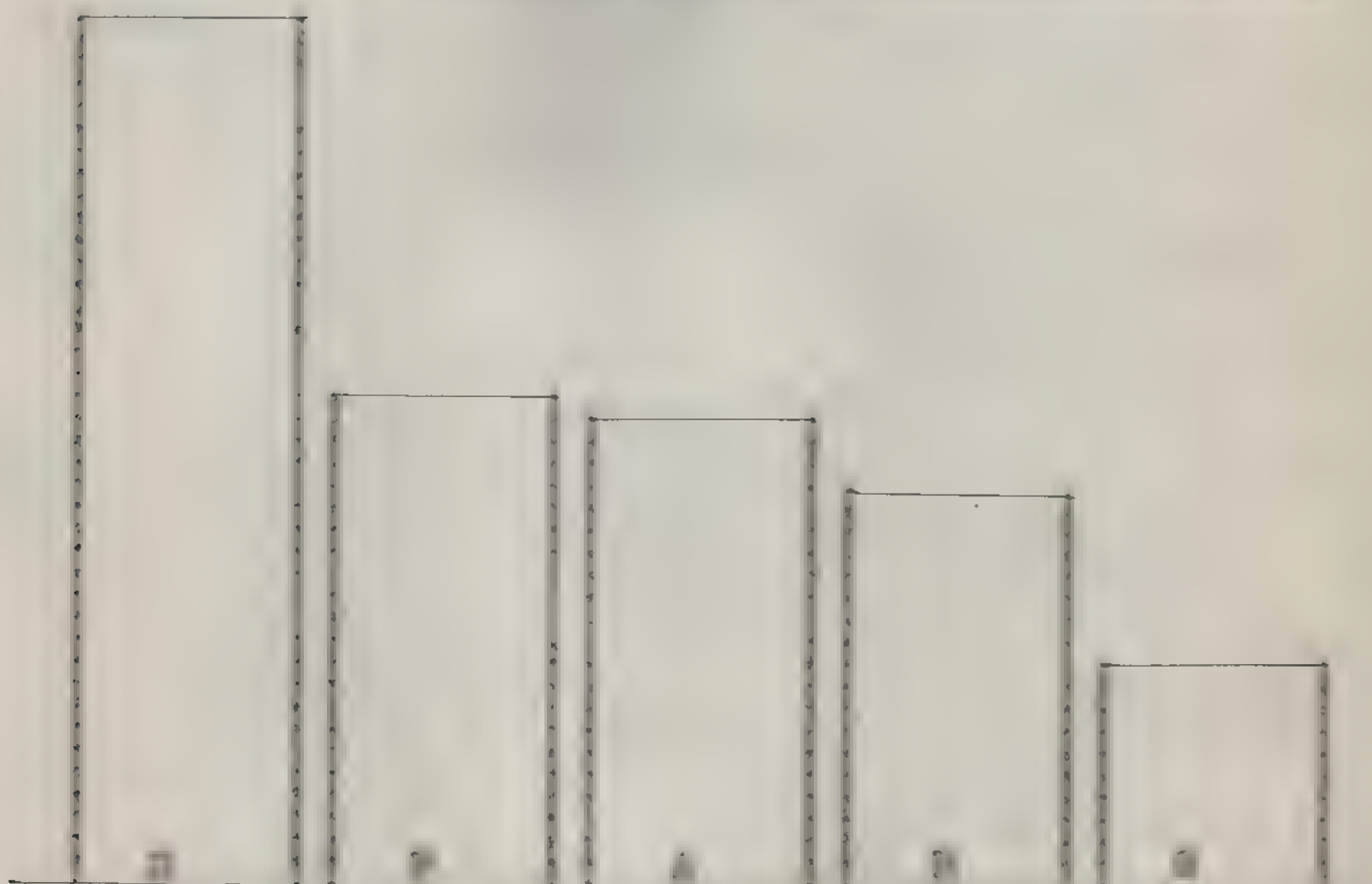
5. The next 1000 hours of the study were devoted to the



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6. The next 1000 hours of the study were devoted to the

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10. The next 1000 hours of the study were devoted to the	11. The next 1000 hours of the study were devoted to the	12. The next 1000 hours of the study were devoted to the



1. Location
 2. Assigned meeting and evaluation
 3. Interviewing
 4. Planning meeting and evaluation
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 6. Planning meeting and evaluation
 7. Interviewing
 8. Planning meeting and evaluation
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 10. Planning meeting and evaluation
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It may be pointed out that the last two named methods of teaching were probably used as supplementary teaching methods, or used entirely in teaching certain principles of the science, which naturally lend themselves best to such methods. In dealing with the principle "where animal parasites may be found" and "Symptoms of parasitic infestation" more than 80 per cent of the teachers use 'field study' as the teaching device for teaching these facts.

Again we find that the more abstract scientific facts such as "Where farm animals belong in the animal kingdom" and "Simple classification of the animal kingdom" were taught by the 'supervised study and recitation' and 'lecture' method. The use of these classroom methods at this point is probably because of the limited time available for the teaching of all these facts.

SUMMARIZATION AND CONCLUSIONS

The result of this study tends to show that related science in the animal production course is given considerable attention. As was shown from results obtained in the study all of the seven sciences listed in the questionnaire were considered important and taught by a large per cent of the vocational agriculture teachers.

It is not the purpose of this paper to point out defi-

nitely and conclusively which of the sciences were considered most important.

The study shows considerable emphasis was laid upon chemistry as a related science to the animal production course. Hearst (1928) found that chemistry is considered more important than other natural sciences.

Related sciences studied, based upon frequency of one or more principles being taught, rank as follows:

91.8%	of the teachers taught	Chemistry
90.9%	of the teachers taught	Entomology
90.0%	of the teachers taught	Botany
89.1%	of the teachers taught	Genetics
87.2%	of the teachers taught	Physics
86.3%	of the teachers taught	Zoology
81.8%	of the teachers taught	Bacteriology

It was the purpose of this study to determine what was the order of emphasis placed on each of the related science principles, most commonly taught by the vocational agriculture teachers. By referring to Tables I, III, V, VII, IX, XI, and XIII, it will be seen that emphasis was given rather uniformly in the teaching of related science principles. A study of the results obtained will show that there was a definite selection of the different principles listed and a gradual gradation from the more important to the lesser important facts. The more readily applicable scientific facts were given greatest attention.

In methodology we find a variation of practices in use.

A study of Tables II, IV, VI, VII, X, XII and XIV on methods used most commonly in presenting these facts indicates the following choices in the different sciences prevailed:

<u>Science</u>	<u>First Choice</u>	<u>Second Choice</u>	<u>Third Choice</u>
Bacteriology	Laboratory exercise	Lecture	Supervised study and recitation
Botany	Supervised study and recitation	Assigned reading and recitation	Lecture
Chemistry	Supervised study and recitation	Lecture	Assigned reading and recitation
Entomology	Supervised study and recitation	Assigned reading and recitation	Lecture
Genetics	Lecture	Supervised study and recitation	Assigned reading and recitation
Physics	Supervised study and recitation	Lecture	Assigned reading and recitation
Zoology	Supervised study and recitation	Assigned reading and recitation	Lecture

The above ranking indicates that much use is made of 'study and recitation' method. The 'lecture' method while given first choice in connection with one science only was too much in evidence when considered from standpoint of first three choices. 'Illustrations' and 'field trips' are much in use by vocational agriculture teachers.

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